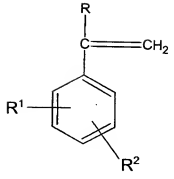
WHAT IS CLAIMED IS:

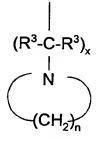
1. A process for preparing a rubbery polymer having a high vinyl content which comprises: copolymerizing at least one diene monomer and a functionalized monomer with a lithium initiator selected from the group consisting of allylic lithium compounds and benzylic lithium compounds at a temperature which is within the range of about 5°C to about 120°C in the presence of a Group I metal alkoxide and a polar modifier, wherein the molar ratio of the Group I metal alkoxide to the polar modifier is within the range of about 0.1:1 to about 10:1; and wherein the molar ratio of the Group I metal alkoxide to the lithium initiator is within the range of about 0.05:1 to about 10:1.

2. A high vinyl polydiene rubber which is comprised repeat units that are derived from at least one conjugated diene monomer and a functionalized monomer, wherein at least 50 percent of the repeat units are of vinyl microstructure based upon the total number of polydiene repeat units in the rubbery polymer, wherein said high vinyl polydiene rubber has a weight average molecular weight of at least 300,000, wherein said high vinyl polydiene rubber has a monomodal polydispersity of at least 1.2, and a ratio of radius of gyration to weight average molecular weight of greater than 0.078 nm·mol/kg , wherein the radius of gyration is determined at the weight average molecular weight by multi angle laser light scattering and wherein the weight average molecular weight is determined by multi angle laser light scattering.

3. A process as specified in claim 1 wherein the functionalized monomer is of the structural formula:



wherein R represents an alkyl group containing from 1 to about 10 carbon atoms or a hydrogen atom, and wherein R^1 and R^2 can be the same or different and represent hydrogen atoms or a moiety of the structural formula:



wherein x represents an integer from 1 to about 10, wherein n represents an integer from about 1 to about 10, and wherein R3 represents a hydrogen atom or an alkyl group containing from 1 to 4 carbon atoms, with the proviso that R^1 and R^2 can not both be hydrogen atoms.

4. A process as specified in claim 2 wherein R represents a hydrogen atom.

5. A process as specified in claim 2 wherein n represents 4 or 6.

6. A process as specified in claim 2 wherein x represents 1.

7. A process as specified in claim 2 wherein

the conjugated diolefin monomer is 1,3-butadiene.

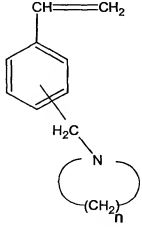
8. A process as specified in claim 2 wherein the conjugated diolefin monomer is isoprene.

9. A process as specified in claim 2 wherein the rubbery polymer is further comprised of repeat units that are derived from a vinyl aromatic monomer.

10. A process as specified in claim 9 wherein the vinyl aromatic monomer is styrene.

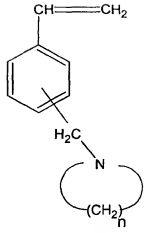
11. A process as specified in claim 2 wherein the functionalized monomer is present in the rubbery polymer at a level which is within the range of 0.1 to 10 parts by weight per 100 parts by weight of monomer.

12. A process as specified in claim 2 wherein the functionalized monomer is of the structural formula:



wherein n represents the integer 4.

13. A rubbery polymer as specified in claim 2 wherein the functionalized monomer is of the structural formula:



wherein n represents the integer 6.

14. A process as specified in claim 2 wherein said polar modifier is selected from the group consisting of diethyl ether, di-n-propyl ether, diisopropyl ether, di-n-butyl ether, tetrahydrofuran, dioxane, ethylene glycol dimethyl ether, ethylene glycol diethyl ether, diethylene glycol dimethyl ether, diethylene glycol diethyl ether, triethylene glycol dimethyl ether, trimethylamine, triethylamine, N,N,N',N'-tetramethylethylenediamine, N-methyl morpholine, N-ethyl morpholine, N-phenyl morpholine, and alkyltetrahydrofurfuryl ethers.

15. A process as specified in claim 1 wherein the molar ratio of the Group I metal alkoxide to the polar modifier is within the range of about 0.2:1 to about 5:1; and wherein the molar ratio of the Group I metal alkoxide to the lithium initiator is within the range of about 0.05:1 to about 10:1.

16. A process as specified in claim 15 wherein the polymerization is conducted at a temperature which is within the range of about 5°C to about 120°C.

17. A process as specified in claim 16 wherein the Group I metal alkoxide is a sodium salt of a

cyclic alcohol.

18. A process as specified in claim 17 wherein the Group I metal alkoxide is sodium mentholate.

19. A process as specified in claim 18 wherein the molar ratio of the metal salt of the cyclic alcohol to the polar modifier is within the range of about 0.5:1 to about 1:1; and wherein the molar ratio of the metal salt of the cyclic alcohol to the lithium initiator is within the range of about 0.2:1 to about 3:1.

20. A process as specified in claim 19 wherein said polar modifier is N,N,N',N'-tetramethyl ethylenediamine.

21. A process as specified in claim 18 wherein the polymerization is conducted at a temperature which is within the range of about 20°C to about 80°C.

22. A process as specified in claim 18 wherein the polymerization is conducted at a temperature which is within the range of about 40°C to about 70°C.

23. A process as specified in claim 2 wherein the lithium initiator is an allylic lithium compound.

24. A process as specified in claim 2 wherein the lithium initiator is a benzylic lithium compound.

25. A process as specified in claim 24 wherein said initiator system is void of alkyl lithium compounds.

26. A high vinyl polydiene rubber as specified in claim 2 wherein the ratio of the radius of gyration

to weight average molecular weight of the high vinyl polydiene rubber is greater than 0.08 nm·mol/kg.

27. A high vinyl polydiene rubber as specified in claim 26 wherein the monomodal polydispersity of the high vinyl polydiene rubber is at least 1.3.

28. A high vinyl polydiene rubber as specified in claim 27 wherein the high vinyl polydiene rubber has a weight average molecular weight that is within the range of about 400,000 to about 1,000,000.

29. A high vinyl polydiene rubber as specified in claim 28 wherein the high vinyl polydiene rubber has a number average molecular weight of at least 55 percent.

30. A high vinyl polydiene rubber as specified in claim 29 wherein the ratio of the radius of gyration to weight average molecular weight of the high vinyl polydiene rubber is greater than 0.082 nm·mol/kg.

31. A high vinyl polydiene rubber as specified in claim 30 wherein the monomodal polydispersity of the high vinyl polydiene rubber is at least 1.4.

32. A high vinyl polydiene rubber as specified in claim 27 wherein the high vinyl polydiene rubber has a weight average molecular weight that is within the range of about 350,000 to about 2,000,000.

33. A high vinyl polydiene rubber as specified in claim 29 wherein the polydiene repeat units in the high vinyl polydiene rubber are derived from 1,3-butadiene and wherein the high vinyl polydiene rubber is high vinyl polybutadiene rubber.

34. A high vinyl polydiene rubber as specified in claim 29 wherein the polydiene repeat units in the high vinyl polydiene rubber are derived from isoprene and wherein the high vinyl polydiene rubber is 3,4-polyisoprene rubber.

35. A high vinyl polydiene rubber as specified in claim 33 wherein the repeat units in the high vinyl rubber are further derived from a vinyl aromatic monomer.

36. A high vinyl polydiene rubber as specified in claim 35 wherein the vinyl aromatic monomer is styrene and wherein the high vinyl polydiene rubber is styrene-butadiene rubber.